

PROJECTION APPARATUS, METHOD OF MANUFACTURING THE APPARATUS,
METHOD OF EXPOSURE USING THE APPARATUS, AND METHOD OF
MANUFACTURING CIRCUIT DEVICES BY USING THE APPARATUS

ABSTRACT OF THE DISCLOSURE

5 The quantity of ultraviolet light (IL) incident on a
projection optical system (PL) is measured by means of an
integrator sensor (9), and the quantity of ultraviolet pulse
light (IL) that has passed through the projection optical
system (PL) is measured by means of an irradiation monitor
10 (32). The quantity of transmitted light is divided by the
quantity of incident light to calculate the proportion at
which the ultraviolet pulse light (IL) is attenuated in the
projection optical system (PL), or an attenuation factor.
The attenuation factor is determined as a function of the
15 integrated value of the quantity of incident light. During
exposure, the integrated value as quantity measured by means
of the integrator sensor (9) is substituted into the
function to estimate the transmissivity (attenuation factor)
of the projection optical system (PL). The output of an
excimer laser source (1) is controlled according to this
20 attenuation factor to control the exposure thereby
preventing lowering of exposure control precision due to
illumination variations (or pulse energy variations) on the
substrate caused by attenuation variations (transmissivity
25 variations) in the projection optical system.